

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

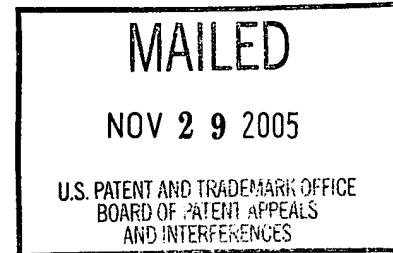
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAWRENCE ROBERT GRZYL, DWIGHT DOUGLAS BACK,
CHARLIE RAMOS and NIDAL ABDUL SAMAD

Appeal No. 2005-2169
Application 09/500,919

ON BRIEF



Before OWENS, KRATZ and PAWLICKOWSKI, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal is from the final rejection of claims 27-32, which are all of the pending claims.

THE INVENTION

The appellants claim a method for extinguishing a fire using an unsaturated perfluorocarbon such as octafluoro-2-butene.

Claims 27 and 30 are illustrative:

27. A method of extinguishing a fire, comprising:
introducing a fire extinguishing composition comprising a
mixture of an unsaturated perfluorocarbon and at least one
additional fire extinguishing agent to the fire; and
maintaining a concentration of the fire extinguishing
composition sufficient to extinguish the fire,
wherein said unsaturated perfluorocarbon has the formula
 C_xF_y , wherein x is 3 or 4 and y is 6 or 8.

30. A method of extinguishing a fire, comprising
introducing a fire extinguishing composition comprising a mixture
of octafluoro-2-butene and at least one additional fire
extinguishing agent to the fire; and
maintaining a concentration of the fire extinguishing
composition sufficient to extinguish the fire.

THE REFERENCES

Robin et al. (Robin)	5,117,917	Jun. 2, 1992
Ohmure et al. (JP '230) ¹ (Japanese Kokai)	5-42230	Feb. 23, 1993

William M. Pitts et al. (Pitts), *Construction of an Exploratory List of Chemicals to Initiate the Search for Halon Alternatives* 54-57 and 132-33 (NIST Technical Note 1279, Aug. 1990).

THE REJECTION

Claims 27-32 stand rejected under 35 U.S.C. § 103 as being
unpatentable over JP '230 in view of Pitts, Robin and optionally
the appellants' admitted prior art.

OPINION

We affirm the aforementioned rejection.

¹ Citations herein to JP '230 are to the English translation thereof by Rodger P. Lewis which is of record.

The appellants argue that the claims stand or fall in three groups: 1) claims 27-29 and 31, 2) claim 32, and 3) claim 30 (brief, page 5). We therefore limit our discussion to claims 30, 32 and one claim in the first group, i.e., claim 27. See *In re Ochiai*, 71 F.3d 1565, 1566 n.2, 37 USPQ2d 1127, 1129 n.2 (Fed. Cir. 1995); 37 CFR § 1.192(c)(7) (1997).

Claim 27

JP '230 discloses a method for extinguishing a fire using hexafluoropropene (C₃F₆) (page 3, claim 6), and teaches that the disclosed fire extinguishing agents can be used in combination (page 3 "at least one kind"; page 6, ¶¶ 0016-0018).

The appellants argue that "[b]ecause JP '230 discloses only one unsaturated perfluorocarbon, i.e., hexafluoropropene, a mixture of this compound with an additional fire extinguishing agents [sic] is based upon obvious to try reasoning" (brief, page 8). JP '230 discloses that the compounds in the list including hexafluoropropene may be used in combination (page 3 "at least one kind"; page 6, ¶¶ 0016-0018). Consequently, the reference would have fairly suggested, to one of ordinary skill in the art, the use of hexafluoropropene in combination with one or more of the other listed fire extinguishing agents.

We therefore are not convinced of reversible error in the

examiner's rejection of claim 27. Accordingly, we affirm the rejection of that claim and claims 28, 29 and 31 that stand or fall therewith.

Claim 32

Claim 32, which depends from claim 27, requires that the step of introducing comprises streaming.²

JP '230 discloses that the fire extinguishing agents can contain "one or more kinds of gaseous jet agents to promote release of fire-extinguishing agent from a fire extinguisher" (page 7, ¶ 0025). This disclosure would have fairly suggested, to one of ordinary skill in the art, streaming each of the JP '230 fire extinguishing mixtures including those containing hexafluoropropene.

The appellants argue, apparently in reliance upon the Rule 132 declaration by Grzyll filed on October 13, 1998 (paper no. 8), that cup burner flame-extinguishing concentration (FEC) data cannot be used to determine the efficacy of fire extinguishing agents for streaming applications (brief, page 9). The appellants argue that Robin discloses only FEC data and that

² "Streaming applications are those in which the agent is applied directly to a fire in the form of a stream, as with a portable fire extinguisher" (Rule 132 declaration by Grzyll filed October 13, 1998, paper no. 8, page 2).

the JP '230 tables in which streaming data are set forth (tables 2 and 3) do not include data for hexafluoropropene or hexafluoroisobutene. See *id.* The appellants conclude that the applied references would not have suggested that octafluoro-2-butene is an efficient agent for extinguishing a fire by streaming (brief, page 12).

The Grzyl declaration is not persuasive because it does not compare octafluoro-2-butene with hexafluoropropene, which is the closest prior art, and the appellants have not established that the data in the declaration for perfluoro-2-butyldtetrahydrofuran or heptafluoropropyl-1,2,2,2-tetrafluoroethyl ether are representative of data for hexafluoropropene.

As for the appellants' argument that hexafluoropropene is not shown in the JP '230 tables 2 and 3 (brief, page 9), that reference is not limited to its examples. See *In re Fracalossi*, 681 F.2d 792, 794 n.1, 215 USPQ 569, 570 n.1 (CCPA 1982); *In re Mills*, 470 F.2d 649, 651, 176 USPQ 196, 198 (CCPA 1972). The JP '230 disclosure that the fire extinguishing agents can contain one or more kinds of gaseous jet agents to promote release of fire-extinguishing agent from a fire extinguisher would have fairly suggested streaming to one of ordinary skill in the art.

We therefore affirm the rejection of claim 32.

Claim 30

Pitts discloses a list of 103 chemicals which are thought to affect flame suppression capability, the list being provided as a basis for a search for alternatives to current commercial halogenated fire suppressants (halons) (page 1). One potential flame suppressant on the list is perfluorobutene-2 (i.e., octafluoro-2-butene) (pages 3 and 79). Pitts does not disclose that octafluoro-2-butene actually is an effective flame suppressant. The disclosure, however, that octafluoro-2-butene is a potential flame suppressant would have provided motivation for one of ordinary skill in the art to use it to extinguish a fire. The remaining question to be resolved is whether the applied prior art would have provided one of ordinary skill in the art with a reasonable expectation of success in doing so.

See *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991); *In re O'Farrell*, 853 F.2d 894, 902, 7 USPQ2d 1673, 1680 (Fed. Cir. 1988).

Robin teaches that C₃ and C₄ saturated perfluorocarbons, specifically octafluoropropane (C₃F₈) and decafluoro-n-butane (n-C₄F₁₀), are effective fire extinguishing agents (col. 3, lines 26-27). JP '230 generically discloses saturated C₁-C₄ fluorocarbons and unsaturated C₃-C₄ fluorocarbons as effective

fire extinguishing agents (page 5), and specifically discloses that octafluoropropane and hexafluoropropene (C_3F_8), i.e., a C_3 unsaturated perfluorocarbon, are effective fire extinguishing agents (page 3). Because C_3 and C_4 saturated perfluorocarbons and the C_3 unsaturated perfluorocarbon are effective fire extinguishing agents, one of ordinary skill in the art would have had a reasonable expectation that a C_4 unsaturated perfluorocarbon, e.g., octafluoro-2-butene, also would be an effective fire extinguishing agent.

Pitts teaches that some thought should be given to the possibility of conversion of octafluoro-2-butene to the toxic perfluoroisobutene isomer (page 133). Pitts, however, teaches that octafluoro-2-butene is mildly toxic by inhalation, having a hazard rating of 1, whereas perfluoropropene, which is also mildly toxic by inhalation, has a higher hazard rating of 3 (pages 132-33). Also, the appellants acknowledge that it was known in the art that perfluoropropene is at least 3.65 times more toxic to rats than octafluoro-2-butene (i.e., the 4-hour LC_{50} for perfluoropropene is 1673 ppm whereas the 4-hour LC_{10} for octafluoro-2-butene is 6100 ppm) (Rule 132 declaration by Grzyll

filed February 10, 1998, paper no. 5, page 4).³ Hence, although the possibility existed for conversion of octafluoro-2-butene to the toxic perfluoroisobutene isomer, one of ordinary skill in the art would have had a reasonable expectation that, with respect to toxicity, octafluoro-2-butene would be suitable as a substitute for perfluoropropene.

Because the applied prior art would have motivated one of ordinary skill in the art to use octafluoro-2-butene to extinguish fires and would have provided such a person with a reasonable expectation of success in doing so, we conclude that this use of octafluoro-2-butene would have been *prima facie* obvious to one of ordinary skill in the art. See *Vaeck*, 947 F.2d at 493, 20 USPQ2d at 1442; *O'Farrell*, 853 F.2d at 902, 7 USPQ2d at 1680.

One of ordinary skill in the art would have been motivated to combine octafluoro-2-butene with conventional fire extinguishing agents to obtain the benefits of each. See *In re Kerkhoven*, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980). The teachings in *Robin* that octafluoro-2-butene's saturated

³ This portion of the Grzyl declaration, which is discussed in the preliminary amendment (filed February 10, 1998, paper no. 5, page 11), is the admitted prior art relied upon by the examiner (answer, page 6).

analog decafluorobutane is effective in combination with conventional fire extinguishing agents (col. 4, lines 42-48), and in JP '230 that the disclosed fire extinguishing agents, which include perfluoropropene, can be used in mixtures (page 6), would have provided one of ordinary skill in the art with a reasonable expectation of success in using octafluoro-2-butene in combination with conventional fire extinguishing agents.

Accordingly, the use of octafluoro-2-butene in combination with conventional fire extinguishing agents would have been *prima facie* obvious to one of ordinary skill in the art. See *Vaeck*, 947 F.2d at 493, 20 USPQ2d at 1442; *O'Farrell*, 853 F.2d at 902, 7 USPQ2d at 1680. For this reason and because the appellants have provided no evidence or technical reasoning to the contrary, we conclude that the use of octafluoro-2-butene in combination with conventional fire extinguishing agents would have been obvious to one of ordinary skill in the art.

The appellants argue (brief, page 6);

[A]lthough JP '230 generically discloses unsaturated carbon fluorides with 3-4 carbon atoms, one of ordinary skill in the art would have been led to practice saturated carbon fluorides (e.g., $CF_3CF_2CF_3$, octafluorocyclobutane) or hydrofluorocarbons because these compounds are shown in Table 1 to have lower fire extinguishing concentrations (FEC) than hexafluoropropene, the only disclosed unsaturated carbon fluoride.

The appellants, however, provide no authority in support of the argument that the only one of a number of flame extinguishing agents disclosed by a reference which would have been *prima facie* obvious to one of ordinary skill in the art is the one which is effective in the lowest concentration. The teaching by Pitts, for example, that unsaturated halocarbons may be more reactive with OH in the troposphere (page 2), would have contributed to leading one of ordinary skill in the art to use them instead of saturated halocarbons. Because all of the compounds in table 1 of JP '230 are disclosed as being effective for extinguishing fires, the reference would have rendered *prima facie* obvious to one of ordinary skill in the art the use of each of them as a fire extinguishing agent.

The appellants argue that Pitts clearly indicates a preference for brominated compounds (brief, pages 6-7). Pitts teaches that a compound which is brominated at certain sites can be expected to release bromine atoms through a thermal mechanism with great rapidity, and that custom synthesis will be necessary to brominate perfluorobutene-2 (pages 54-56). Pitts, however, does not indicate that the disclosed compounds must be brominated in order for them to serve effectively as fire extinguishing agents. Moreover, the indications by Pitts (pages 2-3) and Robin

(col. 1, lines 47-51) that fire extinguishing agents containing bromine may deplete the earth's protective ozone layer would have led one of ordinary skill in the art away from using brominated fire extinguishing agents.

The appellants argue that "[a]ny combination of JP '230 and Pitts would have led one of ordinary skill in the art to substitute the non-toxic blood substitute analog 1,2-bis(perfluoromethyl)ethylene (i.e., $CF_3CH=CHCF_3$), not octafluoro-2-butene, for the hexafluoropropene or hexafluoroisobutene of JP '230" (brief, page 7). Pitts includes bis(perfluoromethyl)ethylene in the list of potential fire extinguishing agents (page 79), and teaches that 1,2-bis(perfluoro-n-butyl)ethylene has been used as a blood substitute and, therefore, seems to be nontoxic (page 55). The appellants are assuming that the teaching that 1,2-bis(perfluoro-n-butyl)ethylene is expected to be nontoxic applies to 1,2-bis(perfluoromethyl)ethylene. Even if this assumption is correct, the appellants have not established that Pitts would have rendered *prima facie* obvious to one of ordinary skill in the art only the disclosed potential fire extinguishing agents which are nontoxic.

For the above reasons we conclude that the method recited in

Appeal No. 2005-2169
Application 09/500,919

the appellants' claim 30 would have been obvious to one of ordinary skill in the art within the meaning of 35 U.S.C. § 103.

DECISION

The rejection of claims 27-32 under 35 U.S.C. § 103 over JP '230 in view of Pitts, Robin and optionally the appellants' admitted prior art, is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

<i>Terry J. Owens</i>)
TERRY J. OWENS)
Administrative Patent Judge)
<i>Peter F. Kratz</i>)
PETER F. KRATZ)
Administrative Patent Judge)
<i>Beverly A. Pawlikowski</i>)
BEVERLY A. PAWLIKOWSKI)
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) APPEALS AND
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Appeal No. 2005-2169
Application 09/500,919

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